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FROM

Pres. C. W. Eliot

*DESTRUCTIVE AND CONSTRUCTIVE ENERGIES OF OUR GOVERNMENT COMPARED.*

AN

# ADDRESS

BY

## CHARLES W. ELIOT

PRESIDENT OF HARVARD UNIVERSITY

BEFORE THE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BOSTON MEETING

FIFTIETH ANNIVERSARY

AUGUST, 1898

[From the PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, VOL. XLVII, 1898.]

Salem Press:
THE SALEM PRESS CO., SALEM, MASS.
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for till the last quarter of the nineteenth century. The hospital ship Bay State is full of appliances for the care of the sick and wounded which are new within twenty years, and have all resulted from scientific discoveries and inventions made in times of peace, and for purposes the opposite of warlike. Physiological science has really arrived at valuable conclusions with regard to the soldier's diet — the indispensable foundation of his effectiveness — conclusions which relate to portability, nutritiousness, and adaptation to different climates; though it must be confessed that these conclusions do not seem to have affected as yet the practice of the United States Commissary Department.[1] Financial science is also

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[1] The ration of the United States soldier is a liberal one in comparison with that of other armies; but if the Commissary Department avails itself of the option to issue pork or bacon, it is a ration ill-adapted to a warm climate. Nevertheless, good cooking would make the American ration an acceptable and wholesome one.

WAR RATIONS:

| BRITISH SOLDIER IN INDIA: | Quantity allowed daily | |
|---|---|---|
| Meat with bone, | 16.00 | ounces |
| Bread, | 16.00 | " |
| Potatoes, | 16.00 | " |
| Rice, | 4.00 | " |
| Sugar, | 2.50 | " |
| Tea, | 0.71 | " |
| Salt, | 0.66 | " |
| Total, | 55.87 | " |
| **GERMAN SOLDIER:** | | |
| Bread, | 26.50 | " |
| Fresh or Raw salt meat, | 13.25 | " |
| or Smoked Beef, Mutton, Ham, Bacon, or Sausage, | 8.82 | " |
| Rice or ground Barley, | 4.41 | " |
| or Peas, Beans, or Flour, | 8.82 | " |
| or Potatoes, | 53.00 | " |
| Salt, | 0.90 | " |
| Coffee roasted, | 0.90 | " |
| or Coffee raw, | 1.00 | " |
| **UNITED STATES SOLDIER:** | | |
| Fresh meat, | 20.00 | " |
| or Salt Beef, | 22.00 | " |
| or Pork or Bacon, | 12.00 | " |
| Bread or Flour, | 18.00 | " |
| Potatoes, | 16.00 | " |
| Peas or Beans, | 2.40 | " |
| Rice, | 1.60 | " |
| Sugar, | 2.40 | " |
| Coffee raw, | 1.60 | " |
| Salt, | 0,25 | " |

a contributor of prime importance; since success in war depends more and more on the command of money and credit. To this war with Spain we owe the most effective revenue bill, or rather the only comprehensive revenue bill, the country has had within a whole generation.

It cannot be doubted, then, that the energy put forth by our Government for the immediate purpose of capturing or destroying Spanish vessels, forts, towns, and war material, and incidentally killing, wounding, and starving Spaniards, has been a great exhibition of power in applied science, and as such must commend itself especially to the attention of this Association. I hear already a protest against the thought that men of science can have any special interest in war,—war the supreme savagery, the legalization of robbery and murder, the assemblage of all cruelties, crimes, and horrors, set up as an arbiter of international justice. I recall the indictment set forth by Charles Sumner forty years ago in his address on the War System, " that this trade of barbarians, this damnable profession, is a part of the War System, sanctioned by International Law; and that war itself is hell, recognized, legalized, established, organized by the Commonwealth of Nations for the determination of International questions!"[1] This is the jurist's and philanthropist's view. But the man of science has another view of war. He regards it as the worst survival of savage life, still occasionally unavoidable because of other survivals of the savage state, such as superstition, passion uncontrolled, and lust of wealth and power. He recognizes the fact that war makes a temporary and local hell on earth, and that all its characteristic activities are destructive; whereas all the normal activities of a free government should be constructive, and intended to promote the good of its citizens and general civilization; but he does not accept Sumner's dictum in his oration of 1845 on "The True Grandeur of Nations," "There can be no war that is not dishonorable." He recognizes that occasional war, and therefore constant preparedness for war, are still necessary to national security, just as police, courts, prisons, and scaffolds are still indispensable to social order and individual freedom in the most civilized and peaceful states. Moreover, the man of science perceives that, while the immediately destructive objects in war are savage and barbarous, the instrumentalities and forces used in modern warfare are closely akin to the great constructive agencies and forces in human society. The battleship is, to be sure, the most complex and the cruelest machine yet constructed by man; but all its parts, except its armament and its armor, are not only applicable in works of peace, but have actually been wrought out for peaceful constructive purposes. The organization and disciplined skill which make possible the equipment of great bodies of soldiers within a few weeks, and their transportation to distant lands with incredible speed and safety, are the same sort of organization and skill needed in every great productive industry; and the mechanical and electrical engineers, who have become indispensable in warfare, have been developed, not for war, but for modern industries and systems of transportation. The applications of Bessemer steel in war are not its primary uses; its peaceful constructive applications give it its primary value. The application of compressed air for the transmission of power was not invented for the dynamite gun, but for tunnelling and mining. The ammonia refrigerating process was not invented for hospital uses in war, but for domestic and commercial cold storage. No nation can now succeed in war which has not developed in peace a great variety of mechanical, chemical, and biological arts. The normal activities of these arts must and do tend to advance humane civilization. Their application to the destructive cruelties of warfare is abnormal. Yet, inasmuch as they are applied in war with a prodigious energy and intensity, it may well be that the acute horrors of even the shortest war may have a lesson for the long normal periods of peace. The destructive activities of the Government of the United States are abnormal and rare; but they are intense, and they attract in a high degree the attention and interest of the people. I therefore wish to call your attention to some of the lessons which this unusual energy of the Government in war suggests in regard to its normal activities in times of peace.

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[1] " 'Give them hell,' was the language written on a slate by a speechless dying American officer. 'Ours is a damnable profession,' was the confession of a veteran British General. 'War is a trade of barbarians,' exclaimed Napoleon in a moment of truthful remorse, prompted by his bloodiest field. Alas! these words are not too strong. The business of War cannot be other than a trade of barbarians — a damnable profession; and War itself is certainly Hell on earth. But consider well — do not forget — let the idea sink deep into your souls, animating you to constant endeavors — that this trade of barbarians, this damnable profession, is a part of the War-system, sanctioned by International Law; and that War itself is Hell, recognized, legalized, established, organized by the Commonwealth of Nations, for the determination of International questions!" (War System of the Commonwealth of Nations: an address by Charles Sumner, before the American Peace Society, at its Anniversary in Boston, May 28, 1849. Boston: Pratt Brothers, 37 Cornhill, 1869. Stereotype Edition. In pursuance of the above vote of our Society, several large editions were issued; but, thinking that a performance of such signal ability ought to have a still wider and more permanent circulation, we asked permission to stereotype it. Mr. Sumner kindly consented; and in preparing this edition, he has made no alteration in any principle or argument from the original address, his views, like our own, having experienced on the question of Peace and War, no change from any events of the last twenty years. Geo. C. Beckwith, Corresponding Secretary. Boston, Jan., 1869.)

One further introductory explanation seems to be needed for the sake of clearness. There is a class of *a priori* social philosophers who would not be at all content with this moderate claim that times of war may have useful lessons for peaceful times; for they believe that the virtues bred and the habits established in war alone make possible the assured progress of society during peace; and that, therefore, occasional wars are to be welcomed as renovators of society, which during peace tends to corruption, luxury, and enfeebling vices. Now men of science, so far as I have observed, generally think that this doctrine just reverses the real order of cause and effect. They do not consider the martial virtues — courage, endurance, loyalty, and the willingness to subordinate self-interest to the interest of clan, tribe, or nation — to be the supreme and ultimate objects towards which the human race must struggle on. They regard these virtues as the elementary, fundamental, preliminary virtues, which can be cultivated in man's savage state, and so become the stepping-stones of his moral advance; but they know, on the demonstrative evidence of both history and natural history, that these virtues may coëxist with cruelty, rapacity, and lust, and an almost complete indifference to both truth and justice. Civilization, in their eyes, means the adding of justice, truth, and gentleness to the martial virtues, an addition which does not necessarily involve any countervailing subtraction. The civilized man should be as brave, enduring, self-sacrificing, and loyal as the savage, and should also be just, truthful, magnanimous, and gentle. The warlike virtues are those of the hunter, and war is a chase with man the prey; but as man rises in the scale of civilization, he is less and less the nomad and the hunter. Truly, it is not war which prepares men for worthy and successful lives in times of peace. On the contrary, it is worthy life in time of peace on the part of individual men or a nation of men, which prepares for success in war; and this principle is quite as true of men in the savage state as in the civilized. The winning tribe in savage warfare is that which in peace lives habitually a simple, hardy, robust life, loves the chase and daring sports, travels fast and far afoot, and subsists at need on what it can find on the way, or carry with it in the rudest methods. In civilized warfare, that nation will be successful which produces plenty of healthy, vigorous, intelligent men, who have added to the ancient martial virtues a moral quality which free institutions can best develop, namely — individual initiative and self-reliance — and have acquired skill in a great variety of useful arts. Do we not all believe that the normal activities of peace under free institutions are the best possible, though not the only necessary, preparation for inevitable war, and that such normal activities of the nation never need to be purified or uplifted by avoidable war? Nevertheless, we may also believe that some lessons for times of peace can be drawn from the prodigiously stimulated activity of the Government and the sacrifices of the people in time of war.

[The first important inference which may be drawn from the experience of our Government and people during the past five months is anthropological — it is the permanence of the martial virtues and their commonness. In any vigorous race these virtues may fairly be called inextinguishable.] A whole generation has passed since this country has been at war, just as a whole generation passed between the war of 1812 and the Mexican War; and yet courage, endurance, and patience were promptly exhibited by hundreds of thousands of our young men. The extinction of the soldierly qualities is not at all to be feared in a robust race inhabiting the temperate zone, which cultivates manly sports, and pursues on land and sea all the occupations which require the maintenance of a watchful struggle against adverse powers of nature, or the utilization of natural forces of mysterious and formidable intensity. Civilized society is always maintaining a perilous conflict with natural forces, which ordinarily serve man's purposes, but sometimes try to overwhelm him. Fire, the greatest of man's inventions, and his humblest servant, suddenly breaks out into destructive fury; wind ordinarily fills his sails, turns his mills, and refreshes the atmosphere of his cities, but now and then in spots sweeps from the surface of the earth and sea all man's works — crops, buildings, vehicles and vessels. The mineral oil which every night lights so brilliantly the humblest homes in every clime occasionally kills the ignorant or careless user, or sets a huge city in flames. Any single-minded worm or insect will be too much for man, unless man knows how to set some other creature of one idea at destroying the first invader. How small is the range of the thermometer within which man can live with comfort or even safety! A change of a few degrees below or above the normal range sets him fighting for his life. This conflict with external nature is the great school of mankind in courage, persistence, patience, and forethought; and mankind never needs any other. The professional soldier may be softened, and perhaps corrupted, by a long period of peace; for in peaceful times he may have nothing to do, or at least his occupation may be so slight and dull as not to keep his physical and mental powers at full play; but a citizen soldiery, when free from the horrible activities of war, returns promptly to the labors of peace, and escapes the dangers to which a professional soldiery is exposed. It is, then, the regular pursuits and habits of a nation in times of peace which prepare it for success in war; and not the virtues bred in war which enable it to endure peace.

The second lesson to be drawn from the recent experience of the nation in war is the immense value of long-prepared, highly-trained public service. The instant efficiency of our navy is a striking demonstration of this principle, which of course needs no enforcement before men devoted to science; but does need to be brought home to the great body of our people. The war teaches that though a navy can be extemporized for the purposes of transport and blockade, for fighting purposes the trained naval expert is the invaluable man, whether in command or behind a gun or in the engine room. The preparedness of our Regular Army for immediate service and the comparative unreadiness of the militia, even in those states which have paid most attention to volunteer military organization, enforce the same lesson. Would that the plain teaching of this short war in this regard might sink into the minds of our people, and convince them of the immense advantages they would derive from a highly-trained, permanent, civil service in every branch of the public administration!

Another lesson of these pregnant months relates to a principle which underlies our form of government, yet is often seen but dimly by portions of our people. I refer to the principle that the Government of the United States should do nothing which any other visible agency — state, city, town, corporation, or private individual — can do as well. This seems a strange principle to be enforced by the action of our Government in time of war, since the Government has a monopoly of that hideous activity; but this war has brought out in a very striking way the fact that, when it comes to the pinch, the source of victory is in the personal initiative of each individual commander and private soldier or sailor. When all preparation is made, when all appliances have been perfected and brought together, in the particular thicket or mined strait in which the work of the moment is to be done, it is the perceptive power and moral resolution of the individual which command success. In warfare as in industries, the automaton counts for less and less, and the thinking, resourceful individual for more and more. The automaton is the natural result of despotic institutions, civil and religious; the resourceful, initiating individual is the natural product of free institutions, under which the citizens are as little restricted as possible in the development and training each of his own will-power and capacities. To secure this fundamental advantage of free institutions. as many fields of activity as possible must be left open to the individual, and to voluntary associations of individuals. If the Government enters a field which individuals, or voluntary associations of individuals, could till, it diminishes by so much the range or reach of the great school of self-governing freemen, namely, the school of creative and constructive industry under liberty and with responsibility. Is it not a wonderful thing that the invention of more and more destructive weapons, like the long-range magazine rifle and the machine gun, which have made impossible close formations, and forced every modern army to imitate what used to be called Indian warfare, should bring out so strikingly, as this recent war has done, the immense superiority of the disciplined freeman to the trained automaton? A firing line is now composed of detached men, each seeking cover at every moment, and all using smokeless powder, that the exact position of the line may not be revealed to the enemy one thousand or two thousand yards away. The enemy is invisible, and there is none of the excitement of personal encounter. The individual soldier is not supported on right and left by bodily contact with comrades, and the nearest officer may be a long way off. Under such circumstances each man must do his own fighting, and success depends on the courage, skill, and judgment of the individual soldier. The maxim, " In time of peace prepare for war," means, therefore, vastly more than it used to. It no longer refers chiefly to the provision of vessels. forts, and weapons, but rather to the bringing up of generations of young men trained by school, college, political life, and the great national industries to habits of self-direction and of disciplined coöperation. This bringing up is best secured under free institutions which leave everything possible to the initiative of the citizen.

This principle — that government should do nothing which any other agency can do as well — being admitted and established, the next question to be considered is whether the legitimate activities of our Government in time of peace, activities directed toward constructive and wholly beneficent objects, should not be increased. On this point I cannot help thinking that the lesson of the war is plain and convincing. It is undeniable that our people have rejoiced in the exhibition of power which the Government has given during this war. We have all derived great satisfaction from our Government's display of power, exercised with promptness, foresight, and the sagacious adaptation of means to ends. It is human nature always and everywhere to enjoy such success as the Government has won, even when it costs heavily in blood and money. To have the consciousness of possessing power, and to display the power possessed, is a national gratification. Now, this sort of satisfaction ought to be obtainable in peace as well as in war; so that the power of the United States, displayed in peace for ends wholly constructive and beneficent, ought to be in some measure comparable with the power the Government is capable of displaying for destructive ends in war. Charles Sumner's argument to the comparative cost of the Ohio, a ship of the line, and of Harvard Unisity[1]— a comparison made in 1845 — helped him to the wrong con-

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[1] " It appears from the last Report of the Treasurer, that the whole available property of the University (Harvard), the various accumulations of more than two centuries of generosity, amounts to $703,175.

Change the scene, and cast your eyes upon another object. There now swings idly at her moorings, in this harbor, a ship of the line, the Ohio, carrying ninety guns, finished as late as 1836, for $547,888; repaired only two years afterwards, in 1838, for $223,012; with an armament which has cost $53,945; making an amount of $834,845 (Document No. 132, House of Representatives, Third Session, Twenty-seventh Congress) as the clusion that war is always dishonorable and always to be avoided, and that preparations for war are foolish and criminal. Nevertheless, the comparison was and is highly suggestive, and becomes more and more so as preparation for war and war itself grow more and more costly. Indeed, in one respect the recent war has made such comparisons more effective and interesting; for it has proved that the defence of coast cities and harbors is easier than we had supposed, since the strongest fleets have no formidable powers of offence against them. Comparatively cheap mines, protected by respectable earthworks on shore, cannot be successfully dealt with by any naval forces yet devised. A navy without an army cannot make conquests: and the defence of all important points on a coast can be extemporized at moderate cost. Such comparisons make us desire that the steady energy of the Government for good ends in times of peace be made to bear a better comparison with its intense energy in the spasms of war. How can the United States put forth during the long periods of peace a beneficent power comparable to the destructive power it wields in war without violating the principle of leaving to its citizens every field of activity which they can till to advantage?

If we examine the fields of activity which must perforce remain to the Government, we shall find that they will amply suffice for the exercise of power enough to gratify the most ambitious and the most benevolent citizen of the Republic. Let us briefly survey some of these fields. The first I shall mention is the fostering of commerce. This function obviously belongs to the general Government, which has power not only to regulate, but to annihilate at will, the trade of its citizens with foreign countries. We have, indeed, seen our foreign commerce destroyed by our own national legislation. Now, commerce, foreign and domestic, is the great peace-

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actual cost at this moment of that single ship; more than $100,000 beyond all the available wealth of the richest and most ancient seat of learning in the land!

Pursue the comparison still further. The expenditures of the University during the last year, for the general purposes of the college, the instruction of the Undergraduates, and for the Schools of Law and Divinity, amount to $46,949. The cost of the Ohio for one year of service, in salaries, wages, and provisions, is $220,000; being $175,000 above the annual expenditures of the University, and more than *four times* as much as those expenditures. In other words, for the annual sum lavished on a single ship of the line, *four* institutions like Harvard University might be sustained throughout the country!" (The True Grandeur of Nations: an oration, by Charles Sumner, delivered before the authorities of the City of Boston, July 4, 1845. Boston: American Peace Society, 1869.)

maker and peacekeeper, and, on the whole, it is the great enricher of mankind in comforts and luxuries. It deserves on every account the fostering care of a powerful nation, not only for the benefits it confers on the members of that particular nation, but because it tends to bring about the confederation of all races of mankind in the pursuit of a common well-being. The war with Spain has distinctly enlarged the moral outlook of our people. It has presented to them wholly unexpected problems concerning the responsibility of a fortunate people for the welfare of the less fortunate. It has suggested to them that a policy of political seclusion and commercial isolation is not worthy of a strong, free, and generous people; and that such a policy is not the way to the greatest prosperity and the most desirable influence.

Another great field of beneficent activity for our Government is the procuring of just and humane conditions of labor in industries which cannot be carried on within the jurisdiction of any single State, because they necessarily cover several States. For the protection of work-people in industries carried on completely within a single State, State legislation may suffice; but when, as in the case of railroads, the industry must be carried on through several or many States, it is only the National Government that can adequately protect the interests of the persons employed. The great functions of the National Government in this respect are now only beginning to be exercised. In the Ninth Annual Report of the Interstate Commerce Commission on the Statistics of Railways in the United States, a report dated June 30, 1897, I read[1] that in the year

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[1] Comparative Summary of Railway Accidents for the years ending June 30, 1896, 1895, 1894, 1893, 1892, 1891, 1890, 1889, 1888:

| Year | Employés | | Passengers | | Other Persons | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Killed | Injured | Killed | Injured | Killed | Injured | Killed | Injured |
| 1896 | 1,861 | 29,969 | 181 | 2,873 | 4,406 | 5,845 | 6,448 | 38,687 |
| 1895 | 1,811 | 25,696 | 170 | 2,375 | 4,155 | 5,677 | 6,136 | 33,748 |
| 1894 | 1,823 | 23,422 | 324 | 3,034 | 4,300 | 5,433 | 6,447 | 31,889 |
| 1893 | 2,727 | 31,729 | 299 | 3,229 | 4,320 | 5,435 | 7,346 | 40,393 |
| 1892 | 2,554 | 28,267 | 376 | 3,227 | 4,217 | 5,158 | 7,147 | 36,652 |
| 1891 | 2,660 | 26,140 | 293 | 2,972 | 4,076 | 4,769 | 7,029 | 33,881 |
| 1890 | 2,451 | 22,396 | 286 | 2,425 | 3,598 | 4,206 | 6,335 | 29,027 |
| 1889 | 1,972 | 20,028 | 310 | 2,146 | 3,541 | 4,135 | 5,823 | 26,309 |
| 1888 | 2,070 | 20,148 | 315 | 2,138 | 2,897 | 3,602 | 5,282 | 25,888 |

(Interstate Commerce Commission; Statistics of Railways in the United States, 1896, page 87.)

1896 the number of railroad employés killed in the service was 1861, and the number injured 29,969, the number of men employed on the railroads of the United States in this year being 826,620. In 1897 the corresponding figures were 1,693 killed and 27,667 injured. These actual numbers equal the casualties of a great battle; but the deaths and injuries occurred in a single year, and are not above the average of the five years preceding. The total number of persons killed on American railroads in the year 1896 was 6,448, while the injured were 38,687, and these figures are not above the average of the five years preceding. In the same year there were killed and wounded in coupling and uncoupling alone 6,614 trainmen, 1,744 switchmen and flagmen, and 328 other employés, making a total of 8,686 killed and wounded in coupling and uncoupling alone.[1] Of the total number of trainmen in the United States, one in every 152 was killed, and one in every 10 was injured during the railroad year 1896;[2] during 1897 one in 165 was killed and one in 12 injured.

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[1] Accidents in the United States, 1896, in coupling and uncoupling.

| TRAINMEN | | SWITCHMEN, FLAGMEN, AND WATCHMEN | | OTHER EMPLOYÉS | | TOTAL | |
|---|---|---|---|---|---|---|---|
| KILLED | INJURED | KILLED | INJURED | KILLED | INJURED | KILLED | INJURED |
| 157 | 6,457 | 58 | 1,686 | 14 | 314 | 229 | 8,457 |

(Interstate Commerce Commission; Statistics of Railways in the United States, 1896, page 88.)

[2] Comparative summary showing number of employés and trainmen for one killed and for one injured in the United States, for the years ending June 30, 1896, 1895, 1894, 1893, 1892, 1891 and 1890:

| YEAR | NUMBER OF EMPLOYÉS FOR ONE | | NUMBER OF TRAINMEN FOR ONE | |
|---|---|---|---|---|
| | KILLED | INJURED | KILLED | INJURED |
| 1896 - - - - - - - - | 444 | 28 | 152 | 10 |
| 1895 - - - - - - - - | 433 | 31 | 155 | 11 |
| 1894 - - - - - - - - | 428 | 33 | 156 | 12 |
| 1893 - - - - - - - - | 320 | 28 | 115 | 10 |
| 1892 - - - - - - - - | 322 | 29 | 113 | 10 |
| 1891 - - - - - - - - | 296 | 30 | 104 | 10 |
| 1890 - - - - - - - - | 306 | 33 | 105 | 12 |

(Ibid, page 96.)

Great battles do not occur every year; but these losses do. Do not these terrible figures suggest that our Government has not yet undertaken to discharge its duty of protecting by legislation large classes of its citizens engaged in indispensable service to the community? The obstacles to the use of automatic couplers are pecuniary alone. On June 30, 1896, only about one-third of the total equipment of American railroads in cars and locomotives was fitted with train-brakes, and only about two-fifths were fitted with automatic couplers. Have we not here a new function for our Government in which the wise exercise of its great power would have far-reaching beneficent results?

As time goes on, it appears that more and more industries have a national scope. Thus, it may be doubted whether the mining of soft coal can be successfully regulated by the separate legislation of single States; for coal mined in Virginia is necessarily in competition with coal mined in Ohio, for example, and the unprotected condition of laborers in Ohio may prevent the adequate protection of coal miners in Virginia. Within a few months New England cotton manufacturers have been startled by the development of the cotton manufactures in the Southern States; and one of the first suggestions of remedy made by the New England operatives was a national law to regulate hours of labor in cotton mills all over the country. This incident simply marks a tendency. Interests common to many States certainly suggest that the common Government has duties in regard to them.

An established function of our National Government is the execution of public works for the improvement of rivers and harbors,—works which redound to the advantage of the localities where they are situated, to be sure, but also to that of the people at large. These works are too often executed in a slow, wasteful manner, which no private person or corporation could possibly afford. As an illustration of bad Government methods, and therefore of the possibilities of improvement in governmental efficiency, I take the Columbia river at the Cascade Gorge. This improvement comprises works on a great lock and on a canal about three thousand feet long, including the lock. The original estimate of the cost was a million and a half dollars, and the work was actually begun in 1878. At the end of 1891, when $1,609,324.94 had been expended on the work, the estimate for its completion was a million and three-quarters dollars. It is not yet finished, after the lapse of twenty years.[1] In six of the years since the first appropriation was made, Congress made no appropriation whatever. Until 1893 it never appropriated anything like the sum which the engineers reported could profitably be expended in the following year, and even then the appropriation lacked half a million dollars of the money the engineers wanted. The total expended to date is more

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[1] Columbia River at Cascade:

| Year. | Appropriations. | Amt. Expended including liabilities and contracts. | Available. | Estimated amt. that could be profitably expended in following year. | Estimate for completion from date. |
|---|---|---|---|---|---|
| 1876 | 90,000 00 | | 90,000 00 | | |
| 1877 | | 4,616 65 | 90,000 00 | 500,000 00 | 1,459,136 00 |
| 1878 | 150,000 00 | 5,854 05 | 235,383 35 | 500,000 00 | 1,524,338 00 |
| 1879 | 100,000 00 | 44,785 87 | 329,529 30 | 500,000 00 | 1,424,338 00 |
| 1880 | 100,000 00 | 207,626 83 | 384,743 43 | 500,000 00 | 1,324,338 00 |
| 1881 | 100,000 00 | 83,269 43 | 217,116 60 | 750,000 00 | 1,224,338 00 |
| 1882 | 265,000 00 | 133,329 57 | 133,847 17 | 500,000 00 | 1,655,397 00 |
| 1883 | | 186,233 53 | 265,517 60 | 500,000 00 | 1,655,397 00 |
| 1884 | 150,000 00 | 73,586 92 | 79,284 07 | 500,000 00 | 1,505,397 00 |
| 1885 | | 133,873 48 | 155,697 15 | 750,000 00 | 1,250,000 00 |
| 1886 | 187,500 00 | 19,050 74 | 21,823 67 | 800,000 00 | 1,100,000 00 |
| 1887 | | 110,445 55 | 190,272 93 | 400,000 00 | 1,850,000 00 |
| 1888 | 300,000 00 | 77,788 44 | 79,837 38 | 500,000 00 | 1,550,000 00 |
| 1889 | | 221,835 26 | 302,347 59 | 700,000 00 | 1,250,000 00 |
| 1890 | 435,000 00 | 72,858 38 | 80,512 33 | 900,000 00 | 1,115,000 00 |
| 1891 | | 234,170 24 | 442,653 95 | 1,500,000 00 | 1,745,000 00 |
| 1892 | 326,250 00 | 190,650 11 | 208,483 71 | 1,419,250 00 | 1,419,250 00 |
| 1893 | 1,239,653 00[1] | 19,398 27 | 1,583,736 60 | . | |
| 1894 | | 330,984 95 | 1,564,338 33 | | |
| 1895 | | 630,000 00 | From Bookkeeper's accounts. | | |
| 1896 | | 427,001 28 | | | |
| 1897 | | 342,248 72 | | | |

[1] Sundry Civil Act of 1893,— "not more than ¾ to be expended during the fiscal year ending June 30, 1894."

| | |
|---|---|
| Total expended, . . . . . . . . . . | 5,007,742 00 |
| Original estimate, . . . . . . . . . | 1,459,136 00 |
| Total expended with interest [illegible] of 1897 at 4%, . | 5,880,000 00 |

than five millions of dollars, not counting interests on expenditures which have stretched over twenty years. In the meantime not a particle of benefit has accrued to the population on the Columbia river or to the nation at large. The delay and waste have been caused by scanty and intermittent appropriations, involving frequent suspensions of work and the deterioration of an expensive plant.[1] The cost of the work has been greatly enhanced by the necessity of renewing the plant, and recruiting anew at short intervals the whole force of work-people. If a vigorous corporation had undertaken the work, it could have completed the job within six years, and would thereafter have enjoyed a good income on the money invested. It is impossible for the nation at large to take satisfaction in grand works so feebly conducted. Such a process impairs, rather than increases, the self-respect of the nation; for everybody perceives that it is a stupid and discreditable process. Whenever a public work must be completed before the country can derive any benefit from it, the Government should prosecute the work with all the dispatch consistent with thoroughness of execution. This single instance illustrates the opportunities for immense improvement in the conduct of the operations of our Government on public works. Already, there are some examples which indicate that better times are in store for us in this respect. Thus, in 1884, estimates of $3,710,000 were submitted for clearing out the mouth of the Columbia River by dredging and constructing jetties. On June 30, 1896, this work was practically finished at a cost of two millions of dollars, favorable circumstances and prompt, continuous work having effected a saving of a million, seven hundred thousand dollars.[1] The rapid erection of the Library of Congress under the direction of General Casey within the original estimates is another hopeful example.[2] The self-respect of the nation is enhanced by every public improvement which is well planned and well executed, and then turns out to be of public benefit proportionate to the expenditure. The cost of clearing the mouth of the Columbia river was not so much as the cost of one armored cruiser; but it is a permanent work of daily utility, the beneficence of which is without alloy.

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[1] Extracts from the reports of U. S. Engineers in charge of the work.

Report of Major James, 1885: " In conclusion, I will only add that if the necessary funds can be afforded, I can open this work for navigation inside of two years, and that every year saved in the opening of navigation through the Cascade Mountains will save to the masses of people affected a sum approximate to the whole cost of the work."

Captain Powell, 1887: " Operations had been generally suspended, from want of funds, for several months previous to August, 1886. . . . . The estimate of cost for completing the canal with the single lock, carefully revised during the year and based on the costs of work done, gives a total in round numbers of $1,850,000. The increase over the original estimate results principally from previously uncounted expenses from suspension of work; the severity of the climate and difficulties of the situation at the Cascade Gorge, were, I judge, not sufficiently considered. . . . On account of small and uncertain appropriations the opening of the Cascade Canal will require several years."

Major Thomas H. Handbury, 1888: " For all works of this character, where the improvement to be effected must be completed before any advantage can accrue to commerce, it does seem that the policy of small appropriations running through a long term of years enhances enormously their ultimate cost "

Major Handbury, 1890: " On the 5th (of July) active work was resumed and continued until November when it was discontinued on account of unfavorable weather and a scarcity of funds."

Major Handbury, 1891: "The estimated amount yet to be appropriated for completing the work is $1,745,500. If this amount were available now, so that the work from this time forward could be pushed to the full extent of our arrangements and the capacity of the plant now provided, it is within the range of possibility, under ordinary circumstances of weather, to advance it so near completion that boats could be regularly passed through the lock by the end of the year 1892; but this is not the case; . . . . "

To illustrate further the directions in which the beneficent expenditures of our government might reasonably be increased, I now invite your consideration of certain comparisons between items of military and naval expenditure which the Cuban war has forced on our attention, and the cost of some government establishments which are of special interest to the Association. The annual cost of the Lighthouse Establishment, on the average of the five years from 1893 to 1897, inclusive, was three million dollars. The cost of maintaining naval vessels in commission during the year

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[1] Extract from Report of Major Handbury, 1891: "Receiving reasonably large appropriations, the officer in charge has been enabled to provide a plant commensurate with the importance and difficulties of the work in hand, and has used this to good advantage. The work has been well organized and pushed forward on business principles, as all large Government work must be if economical results are to be expected. The rock and other materials have thus far been obtained at reasonable figures, and the employés have taken a commendable interest in the success of the project and rendered faithful service. This could not have been done had the work been overshadowed with the constant dread of disorganization on account of limited and inadequate appropriations."

[2] The law of October 2, 1888, put the whole charge of the construction into the hands of General Casey, Chief of Engineers, U. S. Army. In March, 1889, Congress appropriated $5,500,000, in addition to $745,000, a balance of former appropriations. It was then estimated that the time of construction would be eight years. The building was completed just within that time; and there was an unused balance of over $50,000.

1897 — a year of peace — was nine millions of dollars.[1] Now, the Lighthouse Establishment is one of the most interesting and useful departments of national expenditure. It has a high scientific quality, and also a protecting, guiding, friendly quality. It renders an unremitting service in storm and in calm, over rough waters and smooth, on both oceans, on the Great Lakes, and on many rivers, and in all the extremes of climate which our widespread country affords. It calls forth in high degree the best human qualities,— intelligence, fidelity, and watchfulness. It ought to be the object of constant interest on the part of the whole population, and of Congress in particular. With our resources and commercial needs, and our thousands of miles of coasts and rivers, the Lighthouse Establishment ought to be the best in the world, as well as the most extensive. Indeed, it ought to be absolutely as good as it can be made, and every promising experiment for the improvement of any single light or of all lights, of any single foghorn or of all foghorns, ought to be promptly tried by the Government without regard to cost. Some other nations and regions of the earth excel us in the proportion of first-order and second-order lights to all lights, and several nations have experimented more patiently and more successfully than we have with

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[1] From the U. S. Treasurer's Report:

| | 1897. | Average for five years 1893-97. |
|---|---|---|
| Expenses of the Smithsonian, | $ 127,551 75 | 123,882 84 |
| " " National Museum, | 195,740 14 | 173,633 80 |
| " " National Zoölogical Park, | 67,779 26 | 54,920 83 |
| " " Fish Commission, general, | 428,827 27 | 362,078 78 |
| " " Colleges of Agr. and Mech. Arts,. | 1,056,000 00 | 969,600 00 |
| " " Department of Agriculture, | 2,176,530 38 | 2,030,979 84 |
| " " Weather Bureau, | 848,949 81 | 845,360 07 |
| " Preventing Spread of Epidemic Diseases. | 32,677 72 | 127,619 37 |
| " Protecting Public Lands, Timber, etc., | 92,809 69 | 90,689 47 |
| " of the Coast and Geodetic Survey, | 380,865 52 | 417,476 27 |
| " " Lighthouse Establishment, | 3,390,090 45 | 3,002,231 77 |
| " " Marine-Hospital, | 620,506 90 | 646,511 81 |
| " " Geological Survey, | 422,366 82 | 382,824 95 |
| " " " Maps of the United States. | 65,580 11 | 58,707 13 |
| " of "Increase of the Navy," | 14,539,911 36 | 13,680,906 92 |
| Report of the Paymaster General of the Navy. For new ships, | 10,543,373 72 | 1897. |
| Maintaining Ships in Commission, | 8,938,549 71 | |

the electric coast light. There is no doubt that the number of lights and fog-signals might be increased to great advantage, that many more range lights and lighted buoys should be supplied, and that the vessels maintained by the Lighthouse Establishment might be better equipped and better adapted to the service they are expected to render. A government vessel ought always to be of the best possible type, and to be supplied with all the best appliances for its service.

The progress of medical science imposes upon modern governments a new duty towards their citizens, the duty, namely, of protecting them from contagious or infectious diseases. This protection has to be provided by means of inspection stations, quarantines, and other methods proper to secure the isolation of infected persons. The doctrine of State Rights has been invoked in our country to prevent effective inspection and quarantine on our seacoast, and effective isolation in the interior of the country. The assumption by the National Government of an effective control, on the coast and in the interior, over imported infections or contagious diseases, has also been resisted on the ground that national health officers would not be careful of the commercial interests of single ports threatened with the invasion of disease, or actually suffering therefrom; whereas State or municipal authorities would always bear in mind the commercial and industrial interests of the afflicted places. Such arguments against national control of these dangers are narrow and unworthy, and have too long prevented the establishment of an effective National Board of Health. The diseases against which protection is most to be desired are cholera, small-pox, leprosy, and yellow-fever; and these diseases come in at the coast on vessels which are sailing under National authority and regulation. It is impossible to see how an effective control can be exercised over them except by the National Government. The Government has an established agency already, called the Marine-Hospital Service, which has a considerable variety of functions not well indicated by its title. Thus, it examines candidates for the positions of keepers and surfmen in the Life-Saving Service, pilots for steam vessels in regard to color blindness, cadets and seamen for the Revenue-Cutter Service, and renders aid to the Immigrant Service by inspecting arriving immigrants. It is also charged with a certain amount of public health service, but its authority on this subject is not well established, and has often been successfully resisted. It is obvious that the

Marine-Hospital Service is a creditable and useful one, but that it lacks the authority which a National Board of Health should have; and that both its staff and the money placed at its disposal are inadequate to the important ends in view. Now that our Government has driven Spain out from its West Indian colonies, and has assumed possession of Porto Rico, and temporary control of Cuba, an opportunity is afforded of organizing this department, and putting it upon a much more effective footing than would have been possible before. The island of Cuba has been the great source of yellow fever infection; and we now have, temporarily at least, the opportunity of ridding ourselves of this source of danger and dread. At the same time, Congress can reconstruct what is now called the Marine-Hospital Service, and render it, under some other name, a thoroughly effective agent for the protection of the people of the United States from imported preventable diseases. An effective bureau once established would undoubtedly find new opportunities of usefulness to the people. Thus, the pollution of streams occurring within the limits of one State, but affecting the people of other States, is a subject which a National Health Department might very properly deal with; and the disinfection of public interstate conveyances on land and water is another. The community is just beginning to desire the application of effective methods to prevent the diffusion of transmissible diseases. The prohibition of expectoration in public conveyances is a good sign of the advent of better municipal practices with regard to the spread of contagion. The community is also beginning to understand how the industrial effectiveness of the community is diminished by preventable diseases and deaths, and to apprehend the economic aspects of the prevention of disease. The preservation of the public health against the invasion of preventable disease is really one of the great interests of the American people, health and the protection of life to the normal period being infinitely precious to the individual and desirable alike for the happiness and the productiveness of the whole people. Indeed, the public health more directly concerns the public happiness, than does agriculture, mining, trade, or any other of the national activities. The commercial argument for an effective national health bureau is a strong one; yet it is the feeblest of all the arguments for the reënforcement of the existing national health agencies. To remove from American families, or greatly diminish, the fear of death by preventable imported disease would be to confer an immense blessing on all classes of our people. The progress of medical science has made typhoid fever a preventable disease, and has reduced the mortality in diphtheria to one-third of the former rate. When the record of this short war with Spain is made up, it will appear that one of the few thoroughly discreditable features of the war was the occurrence of numerous cases of typhoid fever in instruction camps within the limits of our own country. The present expenditure of the Government for the Marine-Hospital Service has been about $650,000 a year, on the average for the five years 1893 to 1897. This budget ought to be greatly increased. It would be wholly reasonable for the Government to spend as much on behalf of the public health as it costs to keep three battleships in commission for a year in time of peace, say, one million of dollars. The debates on this subject have been going on for a long time. The cholera invasions of the later forties and early fifties started the discussion. The cholera of 1892 provoked further discussion, and each invasion of our southern coast by yellow fever has increased the public interest in the subject. In Congress, in local boards of trade, and in the communities which have been invaded by epidemic diseases, all aspects of the subject have been reviewed. It is now time for effective action on the part of Congress.

The Life-Saving Service of the United States deserves to be greatly enlarged. The general seacoast of the United States, excluding Alaska, is estimated as 5,705 miles long; but if islands, bays, and rivers to the head of tide water be included, the estimated length reaches 64,559 miles. This mileage does not include 3,000 miles of lake coast, or nearly 5,000 miles of rivers above tide-water.[1] On June 30, 1895, the number of life-saving stations

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[1] In 1889 the Coast and Geodetic Survey at the request of the Light-House Board prepared the following statements of the length, in statute miles, of the general seacoast, and of the coastline including islands, bays, etc., to the head of tide-water:

| | |
|---|---|
| General seacoast of the United States: | |
| Atlantic Ocean | 2,043 |
| Gulf of Mexico | 1,852 |
| Pacific Ocean | 1,810 |
| Alaska | 4,750 |
| Coastline including islands, bays, rivers, etc., to the head of tide-water: | |
| Atlantic Ocean | 36,516 |
| Gulf of Mexico | 19,143 |
| Pacific Ocean | 8,900 |
| Alaska | 26,376 |

This mileage does not include the more than 3,000 miles of the lake coast nor the nearly five thousand miles of rivers which are lighted; but it does include the Alaskan coasts, great parts of which are not lighted.

was only 251, and of these 53 were on the Great Lakes, 1 on the Ohio River, and 13 on the Pacific Coast. For the year ending June 30, 1895, the men at these stations gave aid in 675 cases of disaster, the amount of property involved being eleven millions of dollars, and the number of persons involved about six thousand. The mere mention of these figures demonstrates at once the inadequacy of the number of stations. The men employed must possess skill in surf-work and in the use of the various appliances for life-saving, and must be also men of unquestionable courage and good judgment. They are exposed in their routine of duty to many hardships and dangers. They struggle with wind and cold on the shore, and with some of the most formidable dangers of the sea. They must patrol beaches or rock-bound shores in the worst weather, and must be always ready for prompt service by night and by day. They need all the martial virtues; and these virtues are displayed not in killing and wounding, but in rescuing from death and injury. They must have not only individual courage and skill, but discipline and capacity for combined action in moments of great excitement and stress. As the result of the organization of this service, the number of lives lost in proportion to the number of persons on board vessels suffering disaster within the domain of the Life-Saving Service has been greatly reduced. The ratio for the five years 1875 to 1880 was 1 to 65; the ratio for the years 1890 to 1895 was 1 to 95. Shall we not all agree that this noble service should not be limited in its scope by any pecuniary consideration; but only by the probability of rendering service? When the United States undertakes to save life, and in so doing maintains a fine corps of servants whose manly qualities are all exerted for beneficent purposes, it should not consider what the service properly organized costs, but simply how useful it can be made. The appropriation for the fiscal year 1898 was only $1,562,795.

The Department of Agriculture is of comparatively recent creation, dating from 1893. The appropriations made for this department have always exceeded the amount expended, partly because of its newness, and partly because Congress has been disposed to be liberal in this direction. The proper objects of the department are the discovery, study, and development of the agricultural resources of the United States. It is primarily a scientific and technical bureau. Of its twenty-two divisions, seven are administrative, eight technical, and seven purely scientific. It is distinguished among the departments of the government by having its whole body of servants under Civil Service rules, the only persons not in the classified service being the Secretary, the Assistant Secretary, and the Chief of the Weather Bureau. Its main work is done not in Washington, but at scattered stations all over the country. Thus, there are (1897) outside of Washington 153 observing stations, and 244 stations on the seacoasts and Great Lakes where storm signals are displayed for the benefit of mariners. There are (1898) also 135 meat inspection stations in 35 cities of the country, 28 quarantine stations for imported cattle, 16 stations for inspecting export stock, beside several stations for examining stock for Texan fever. The Division of statistics affords a measure of protection against combination and extortion in buying and selling the products of agriculture. It collects information as to the condition and prospects of the principal crops, tabulates statistics of agricultural productions, and of the distribution and consumption of these products, and issues a monthly crop report for the benefit of producers and consumers. It is obvious that this useful Division tends to check irrational and injurious speculation in food products. The usefulness of the department is beyond all question, whether we consider domestic or foreign commerce, the agricultural industries proper, or the great business of exporting foods. The English government supervises with much care and at large cost the importation, transportation, and marketing of cattle, sheep, and pigs, and of the foods derived from these animals. Why should we be less careful than the English of the welfare of the population in this respect? When we consider the large proportion of our population engaged in industries which this department serves, and the importance of these industries to our national budget, may we not reasonably be surprised that the department is crippled by the parsimony of Congress with regard to salaries? On account of the low salaries authorized for scientific and technical services, the department is constantly losing some of its ablest and best workers. Universities, colleges, and experiment stations carry off the best men. On account of the youth of the department, most of its officers and servants are now young men, who may perhaps be retained for a time at the low salaries authorized by Congress, but are sure to be lost to the service as their age and experience increase. Apart from the Weather Bureau, which is now one of its divisions, the cost of the Department of Agriculture during the financial year 1896–97, was rather more than two millions of dollars,— about the cost of one day of the war with Spain.

Next to Agriculture in importance to the country comes the mining of coal and the metallic ores. The mineral wealth of the United States, including coal, is immeasurable, and there lie the foundations of all our manufacturing industries, and of the household comfort with which our population is so greatly blessed. One would naturally have supposed that the government of the United States would have been inclined to spend liberally on the discovery and investigation of our mineral resources, and that the Geological Survey of the United States would always have been carefully fostered, and developed as rapidly as possible. Whenever new territory has come into our possession or been newly occupied, we might naturally have endeavored to obtain with the utmost promptness complete surveys of its geological and mineralogical features, in order to bring to the notice of the population the resources of the new areas. Such has not been the history of the Geological Survey of the United States. The expenditure upon it has never been generous, and has often been parsimonious; and large areas of our country have remained for generations unexplored and unmapped. There has been no method of cordial coöperation between national surveys and state surveys, and the geological investigations of the government have generally followed in the wake of private mining enterprises, rather than led the way. For the average of the five years 1893–97 the expenditure of the Government on the Geological Survey and the issue of geological maps was about $450,000 a year, or less than the cost of six hours' war with Spain during the last four months.

In the city of Washington the Government maintains a National Museum, a National Zoölogical Park, and a Congressional Library. All these three institutions taken together do not cost the Government three hundred thousand dollars a year; whereas the English government spends on the British Museum alone about $600,000 a year.

The Weather Bureau of the United States, on which the nation spends less than a million dollars a year, contributes greatly to the comfort and health of the people and to the protection of their property. The warnings it gives of cold waves, frost, hot waves, and high winds, of the coming of heavy rains and the rise of rivers, have a constantly increasing usefulness; yet its number of stations for weather observation is manifestly insufficient, and the number of places at which warnings are conspicuously given is also insufficient. We owe to the war with Spain the first attempt to establish an adequate number of observation stations in the West Indies,— stations which have been greatly needed from the first establishment of the Bureau. The field of observation ought to be much broadened, and its results ought to be more thoroughly and promptly made known. In the year ending June 30, 1897, that is, before the war, the country spent twice as much on mere repairs of naval vessels as it did on the Weather Bureau.

The Coast and Geodetic Survey of the United States has been a great credit to the country, and has a value not only for the protection of commerce, but for the promotion of geographical science, —a value it would be impossible to estimate. It should be maintained in a state of the utmost efficiency, and its results should be at the service of every mariner and merchant. It is a part of the equipment of our Government which has conferred on the United States scientific distinction. Nevertheless, it has often been crippled in its work by lack of steady, timely, and adequate appropriations. Its annual cost for the five years, 1893–1897, averaged $418,000, or only a little over what it cost to maintain in commission the armored cruiser New York[1] for the year 1897.

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[1] From a Statement showing the amounts authorized for new vessels under "Increase of the Navy" in each act of Congress from Mar. 3, 1883 to and including the act of Mar. 3, 1893, the objects (ships) authorized, the amounts appropriated, the amounts expended upon each vessel authorized, including armor and armament and the actual total cost of completed ships:

| Objects (ships) authorized and dates of acts of Congress. | | Amounts authorized for hull and machinery, including hull armor. | Cost of maintenance for one year, including coal, provisions, repairs and pay of officers, crew, and marines. |
|---|---|---|---|
| Act of Mar. 3, 1885 | Yorktown | 520,000.00 | 155,435.36 |
| " Aug. 3, 1886 | Terror | 630,000.00(?) | 126,561.47 |
| " Mar. 3, 1887 | San Francisco | 1,500,000.00 | 242,845.48 |
| " Sept. 7, 1888 | New York | 3,500,000.00 | 391,065.69 |
| | Bancroft | 260,000.00 | 82,444.47 |
| " June 30, 1890 | Indiana | 4,000,000.00 | 323,695.67 |
| | Oregon | 4,000,000.00 | |
| " Mar. 19, 1892 | Brooklyn | 3,500,000.00 | |

A new department of our Government ought to be at once organized to secure the permanent protection and utilization of the forests on the national domain. The experience of other nations has already demonstrated that well-managed national forest reserves not only pay their expenses, but yield a revenue. The objects of such forest administration are of the utmost importance to a mining and farming population, being, briefly, to ensure a permanent supply of timber, to protect the water-supply in agricultural regions adjacent to the forests, to prevent floods, and to store water which in arid and semi-arid regions can subsequently be utilized for irrigation. The efforts thus far made to protect the national property in forests have not been successful, the greatest destruction being wrought by fire, and by pasturage,[1] but much harm being also

*(Note continued from page 26.)*

| SHIPS. | AMOUNT EXPENDED. | | | | |
|---|---|---|---|---|---|
| | For hull and machinery, including hull armor. | For armor for gun protection. | For armament. | For equipment, Bureaus of Equipment, Construction and Repair and Steam Engineering. | TOTAL |
| Yorktown | 548,906.61 | | 156,722.64 | 62,401.34 | 768,030.59 |
| Terror | 1,234,810.91 | 144,664.64 | 133,853.68 | 64,489.17 | 1,577,818.40 |
| San Francisco | 1,738,257.82 | | 272,876.54 | 124,168.95 | 2,135,303.31 |
| New York | 3,727,541.29 | 170,299.03 | 341,626.43 | 107,175.64 | 4,346,642.39 |
| Bancroft | 362,505.05 | | 47,559.50 | 21,217.08 | 431,281.63 |
| Indiana | 4,355,893.53 | 977,134.02 | 553,972.48 | 95,691.45 | 5,982,691.48 |
| Oregon | 4,868,902.47 | 1,029,591.42 | 585,598.77 | 75,412.09 | 6,559,504.75 |
| Brooklyn | 3,621,268.52 | 323,552.21 | 341,639.82 | 137,330.04 | 4,423,790.09 |

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[1] "Most of the Fresno group (Big Tree lumber) are doomed to feed the mills recently erected near them, and a company of lumbermen are now cutting the magnificent forest on King's River. In these milling operations waste far exceeds use; for after the choice young manageable trees on any given spot have been felled, the woods are fired to clear the ground of limbs and refuse with reference to further operations, and, of course, most of the seedlings and saplings are destroyed.

These mill ravages, however, are small as compared with the comprehensive destruction caused by 'sheepmen.' Incredible numbers of sheep are driven to the mountain pastures every summer, and their course is ever marked by desolation. Every wild garden is trodden down, the shrubs are stripped of leaves as if devoured by locusts, and the woods are burned. Running fires are set everywhere, with a view to clearing the ground of prostrate trunks, to facilitate the movements of the flocks and improve the pastures." (The Mountains of California: by John Muir, New York, The Century Co., 1894, p. 199.)

done by simple stealing of the forest product in districts where there is no adequate policing of the reservations. The experience of Canada has proved, under conditions analogous to those which exist within our own territory, that forest guards and patrols can do much to keep down fires, even in the dryest seasons. The problem in our own country is to procure legislation that will protect the forests, while promoting the occupation by private settlers of land within the districts covered by the reservations which is better adapted to agricultural or mining use than it is to forestry. The opposition to the reservation of forest land which has proceeded from the mining interests is an opposition that prefers the immediate pecuniary interest of a single generation to the permanent pecuniary interest of many generations; for it is certain that diffused mining industries cannot be permanently maintained in regions denuded of timber, except by large companies owning the richest mines, — companies which can support the expense of bringing timber from afar. In semi-arid regions, pasturage is fatal to future forest growth, while in well-watered regions like Oregon and Washington, the injury it inflicts is insignificant; but it is precisely in semi-arid regions that a storage of water for purposes of irrigation is most important. Neither state ownership of forest lands nor private ownership can be satisfactory under present conditions. Private individuals and corporations have an immediate interest in cutting off the timber; and this done, their interest ceases. Wherever forests are cut down for fire-wood, as has happened throughout New England, every tree is cut, and the forest is permanently injured. Many deciduous trees, like the birches and maples, start up again from the stumps, with numerous sprouts, and this sprout-growth remains very inferior to seedling growth. The woods of New England have been seriously damaged by being cropped for fire-wood in successive generations. This may happen in regions where the rainfall is sufficient to secure reforesting; but in arid or semi-arid regions reforesting, when once the original timber has been removed, is extremely difficult or in many cases impossible. Anyone who has travelled through the comparatively treeless countries around the Mediterranean, such as Spain, Sicily, Greece, Northern Africa, and large portions of Italy, must fervently pray that our own country may be preserved from so dismal a fate. It is not the loss of the forests only that is to be dreaded, but the loss of agricultural regions now fertile and populous, which may be desolated by the floods that rush down from bare hills and mountains, bringing with them vast quantities of sand and gravel to be spread over the lowlands. Travelling a few years ago through Tunisie, I came suddenly upon a fine Roman bridge of stone over a wide, bare, dry river-bed. It stood about thirty feet above the bed of the river, and had once served the needs of a prosperous population. Marvelling at the height of the bridge above the ground, I asked the French station-master if the river ever rose to the arches which carried the roadway of the bridge. His answer testified to the flooding capacity of the river and to the strength of the bridge. He said, "I have been here four years and three times I have seen the river running over the parapets of that bridge." That country was once one of the richest granaries of the Roman Empire. It now yields a scanty support for a sparse and semi-barbarous population. The whole region roundabout is treeless. The care of the national forests is a provision for future generations, for the permanence over vast areas of our country of the great industries of agriculture and mining upon which the prosperity of the country ultimately depends. The National Forestry Bureau ought to be at once organized with its director, clerks, inspectors, head overseers, assistant overseers, rangers, and field force, as recommended by the Commission appointed by the National Academy of Sciences on a Forest Policy for the United States. A good forest administration would soon come to support itself; but it should be organized in the interest of the whole country, no matter what it cost. The estimate of the cost of the organization, as made by the Forestry Commission of the Academy, was two hundred and fifty thousand dollars a year for the first five years. This is about the annual cost of the maintenance of the protected cruiser San Francisco.

The Government has carried on for many years an inquiry into the habits, feeding-grounds, and modes of breeding and migration of the fish which make an important part of human food, and inhabit the Western Atlantic and the Eastern Pacific, the Great Lakes, and the rivers and brooks of the continent. It is obvious that no power but that of the general Government can carry on effectively a research of this magnitude, covering such enormous areas, and dealing with such a variety of creatures. The waters of the globe yield food of great variety and great value to mankind; but the habits and conditions of breeding of fish and shell-fish have remained until this century almost unknown, and indeed are still wrapped in much mystery. Yet questions are constantly arising as to possible diminution of this important food-supply, and as to the effects on the permanence of the supply of new methods of catching fish. These great questions are legitimate objects of study by the Government; but it is obvious that such researches require expensive outfit, long time, and highly-trained observers. When to these researches is added the actual breeding of young fish in great quantities for the stocking of rivers, ponds, and brooks, it becomes apparent that the field of labor is simply enormous, and that the economic interests involved are vast and permanent. Now, in this great enterprise the expenditures of the Government during the five years 1893–1897 have been $360,000 a year, which is less than the annual cost of maintaining one of our battleships.

One other mode of beneficent expenditure the United States Government has maintained for a generation, namely, the annual appropriation of money for certain colleges of agriculture and mechanic arts, which were founded under the Act of 1862. In aid of these colleges the Government appropriated in 1897 a million of dollars. It is hard to see why the Government aid should be limited to this particular sort of instruction, to which only a very small percentage of the youth of our country can possibly resort; but if the Government is going to aid exclusively the colleges of agriculture and the mechanic arts, what a pittance is one million a year! Can any of us see with satisfaction our Government spend no more on the annual support of education in agriculture and the mechanic arts throughout the country than on the annual maintenance of three battleships in time of peace?

In instituting these comparisons between military and naval expenditure on the one hand, and expenditure for purely beneficent objects, such as the advancement of science, the development of technical skill, the saving of life, the improvement of industries, and the support of education, on the other, I have no intention of even suggesting that the expenditures on military and naval preparation should be diminished, much less stopped as Charles Sumner proposed. The short war with Spain has taught us the immeasurable value of the Regular Army and Navy, and has justified the expenditure of all the money they have ever cost. As war becomes more and more a matter of science, — chemical, physical, biological, and fiscal, and of highly-trained skill on the part of all who direct or operate the complicated machinery of war, it is manifest that it is the duty of the United States to build and maintain the most perfect instruments and appliances of war that the utmost skill of our engineers and mechanics can produce, and to keep in training adequate bodies of men to use effectively this elaborate machinery. But is it not equally clear that the nation which can afford to make this expenditure can afford to make much freer expenditures than our nation has ever made on the wholly beneficent agencies of the Government, which save life, increase food and ore production, avert evils, facilitate transportation, promote industries and commerce, and foster education? If the self-respect of the nation were habitually increased by the visible achievements of the Government in peace, there would be less chance of the people's being tempted to war by the desire to see the power of the Government exhibited. If the Government habitually displayed a great beneficent power, a power exerted primarily for the good of its own citizens, but secondarily for the good of mankind, and which, in order to its full effects, called for the permanent maintenance of large bodies of disciplined and devoted servants of an excellence comparable with that of the Regular Army and Navy, would there not be solid grounds for pride and satisfaction in our Government which would tend to defend us from seeking that pride and satisfaction in military glory?

After everything possible has been said in favor of martial virtues and achievements, whenever our people really take up the question how best to win glory, honor, and love for free institutions in general, and the American Republic in particular, whether in our own eyes or in the eyes of other nations and later times they will come to the conclusion that more glory, honor, and love are to be won by national justice, sincerity, patience in failure, and generosity in success, than by national impatience, combativeness, and successful self-seeking; and glory, honor, and love more by as much as the virtues and ideals of civilized man excel those of barbarous man.

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